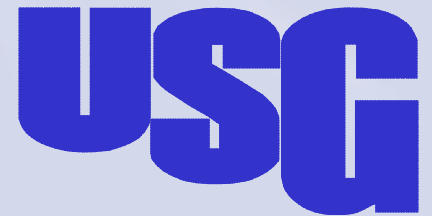


# Fate of Hg in Synthetic Gypsum used for Wallboard Production



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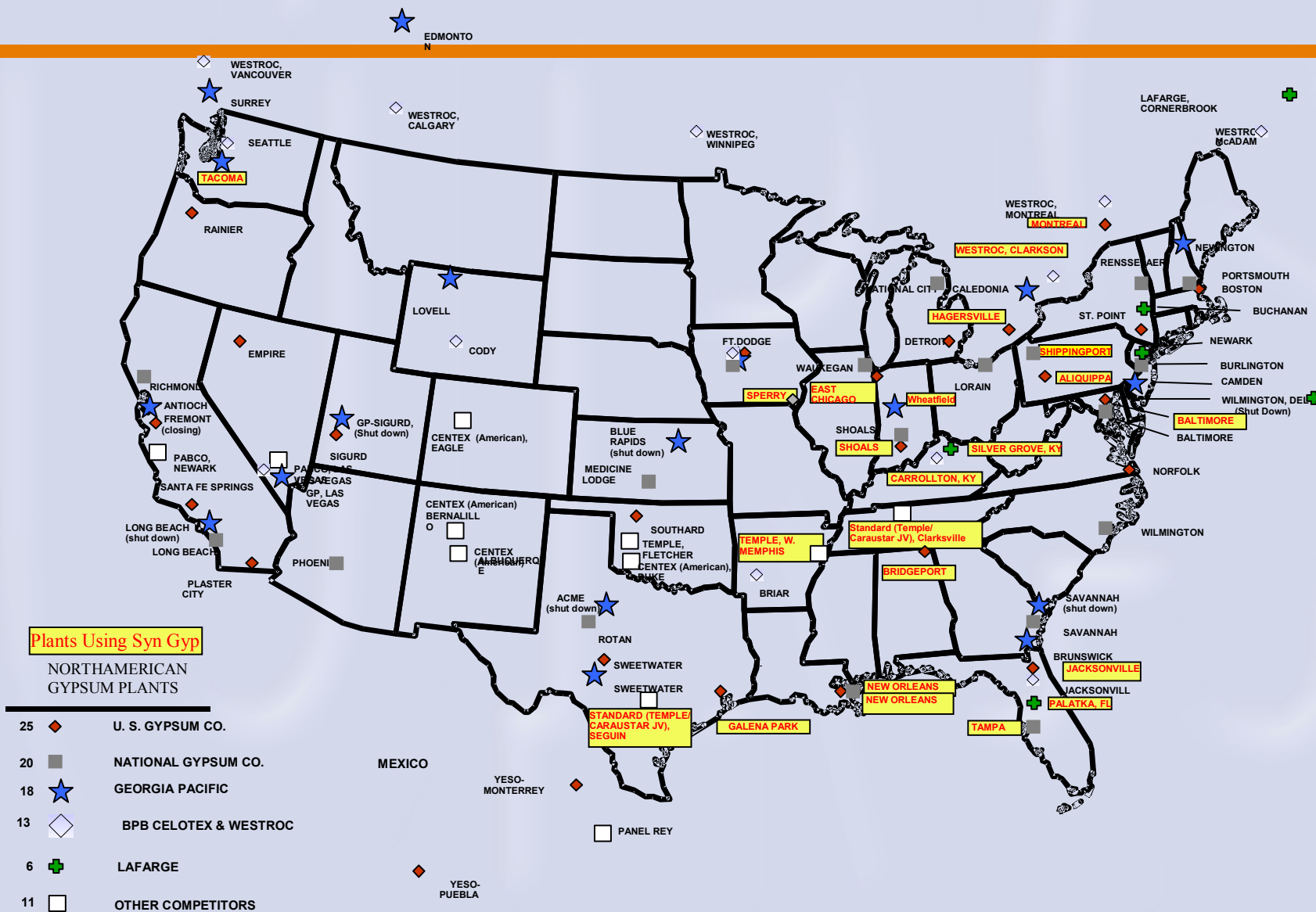


# Background

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- Oxidized Hg is removed by wet FGD systems
- Most of the Hg removed leaves the FGD with the solid byproducts
- 70% of the FGD byproduct reuse in the U.S. is gypsum for wallboard production
  - FGD gypsum accounts for 20-30% of all U.S. wallboard production
- What happens to the Hg in the wallboard process?

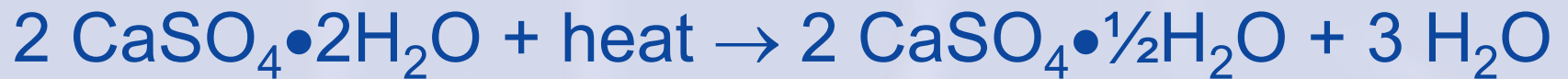
# Wallboard Plants using FGD Gypsum



# The Wallboard Process

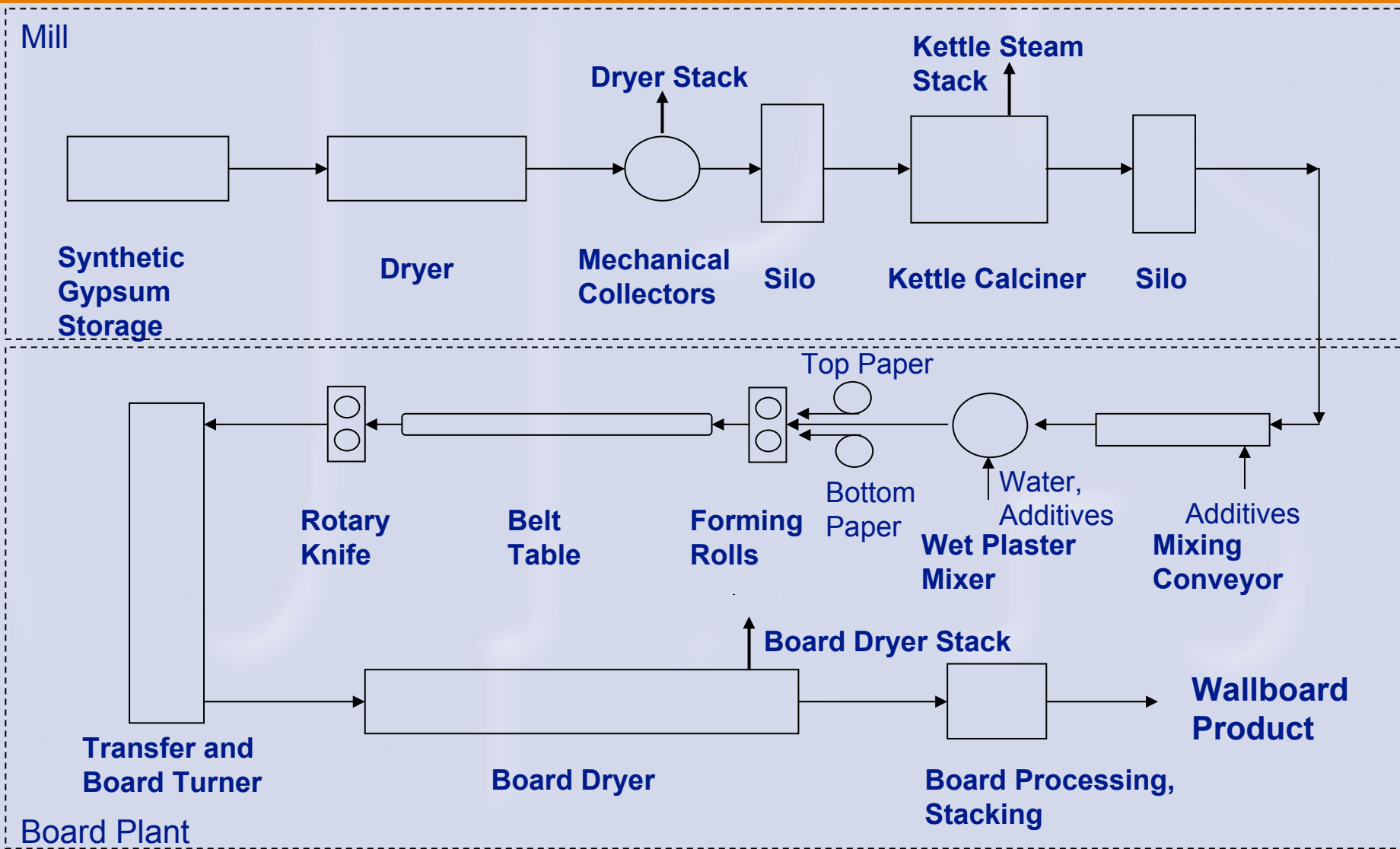
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- Gypsum is dried, then calcined:



- Hemihydrate is later rehydrated to form the board then dried
- Hemihydrate forms at 262°F, anhydrite (undesirable) forms at 325°F
- Lab testing of FGD gypsum conducted by URS for EPRI showed that Hg loss can occur in this temperature range

# The Wallboard Process





# Example USG Wallboard Plant



# Synthetic Gypsum at USG

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- Over 25 years of experience
- Innovator in Use
  - 1st to use 100% FGD synthetic gypsum
- 2002 use over 3,000,000 tons
- 12 Plants Using FGD synthetic gypsum
- 7 Plants Using 100% FGD synthetic gypsum
  - 3 New Lines Built based on synthetic gypsum

# Project Objectives

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- Determine the fate of Hg in FGD gypsum during wallboard production, including Hg losses during drying and calcining
- Determine effects of FGD and power plant design/operating variables on Hg losses during wallboard production
- Evaluate the leaching stability of Hg in wallboard products



# Test Site Matrix

Coal Type	HS Bitum.	HS Bitum.	HS Bitum.	Texas Lignite	HS Bitum.
FGD Reagent	Lime-stone	Lime-stone	Lime-stone	Lime-stone	Lime
Forced Oxidation Mode	In situ	In situ	In situ	In situ	External
Gypsum Fines Blowdown?	No	No	Yes	No	Yes
SCR Operating?	Yes	No	TBD	No	TBD

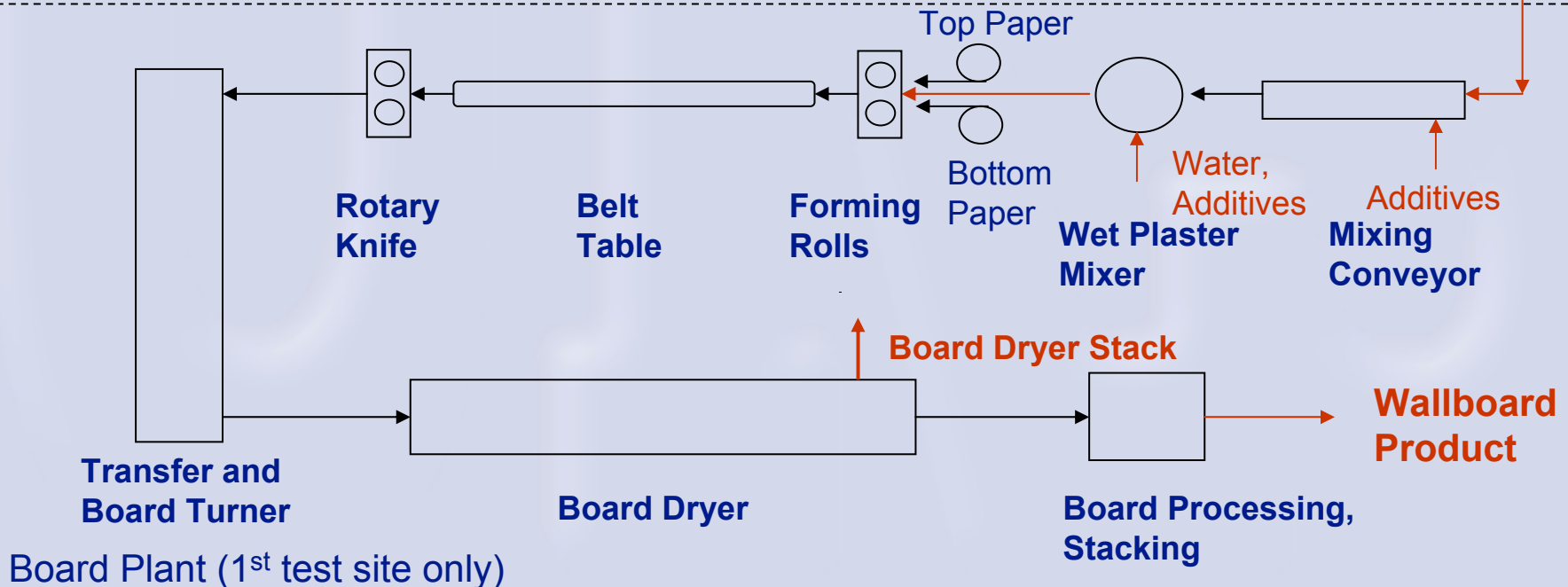
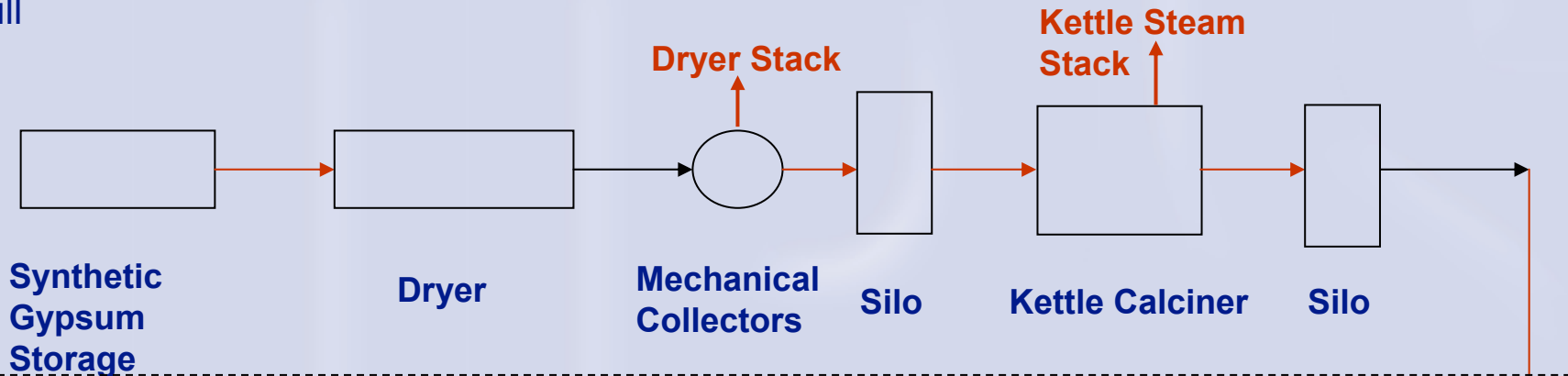
# Project Tasks (per test site)

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- Measure Hg concentrations in raw gypsum dryer and calciner stacks, board dryer stack
- Measure Hg concentrations in process input and wallboard product streams
- Close Hg balance around wallboard plant
- Conduct additional laboratory investigations
  - Hg leaching from wallboard product by TCLP
  - Comparison of Hg in synthetic vs. natural gypsums
  - Laboratory simulation of Hg losses during calcining

# Locations to be Sampled (in red)

Mill



# Project Schedule

Contract Start	July 2004
First Site Test	July 2004
Second Site Test	September 2004
Third Site Test	November 2004
Fourth Site Test	January 2005
Fifth Site Test	February 2005
Final Report	June 2005